NCC: A Performance-based Code

National
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Code

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Introduction

- How it works.
- What you will learn.

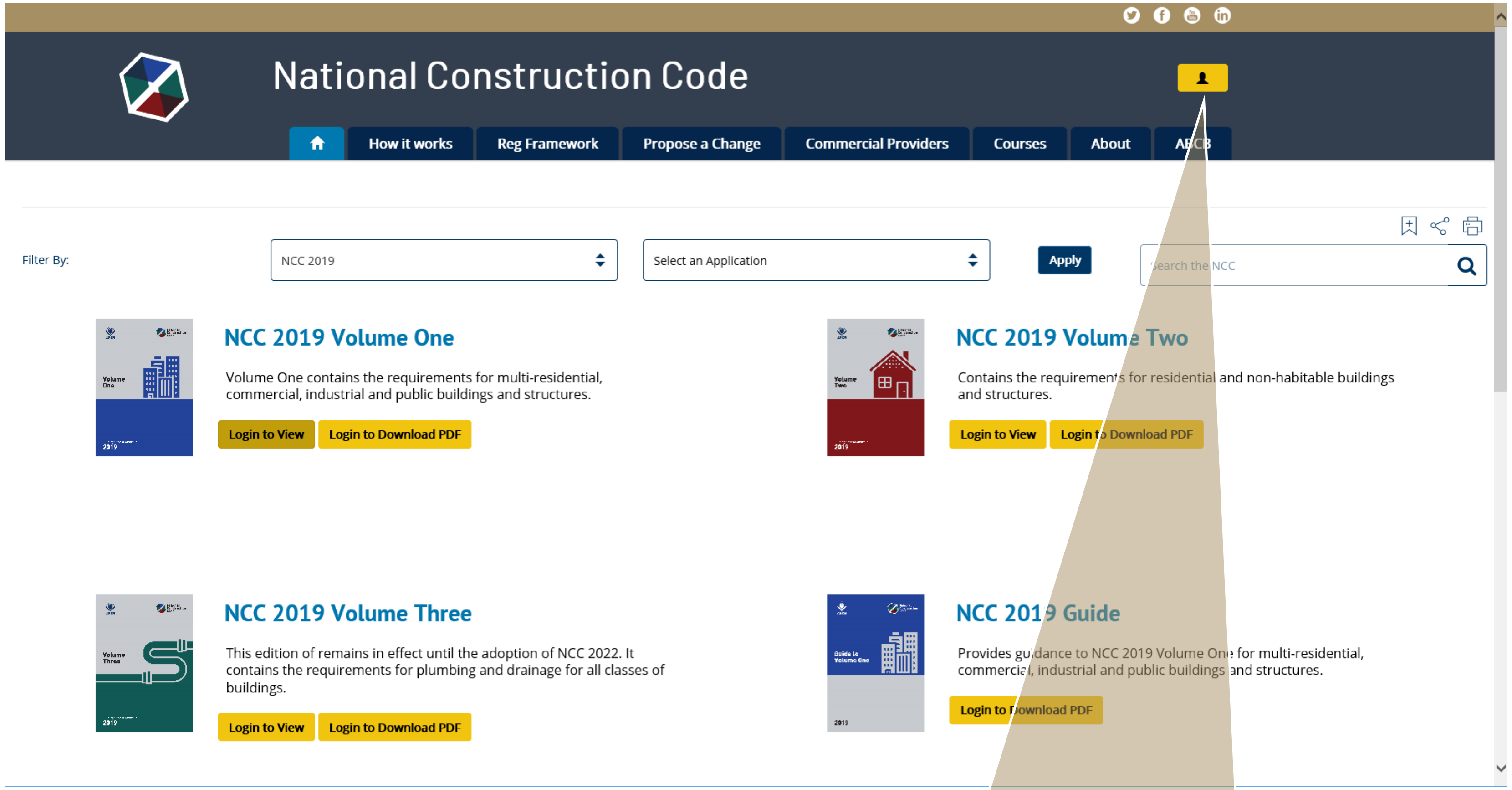
Contents

- Overview of the NCC as a performance-based code.
- Language used in the Performance Requirements of the NCC.
- Performance Solutions and Assessment Methods.

Summary

How to access the NCC

To access the NCC, visit: ncc.abcb.gov.au



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Filter By: NCC 2019 | Select an Application | Apply | Search the NCC

NCC 2019 Volume One

Volume One contains the requirements for multi-residential, commercial, industrial and public buildings and structures.

Login to View | Login to Download PDF

NCC 2019 Volume Two

Contains the requirements for residential and non-habitable buildings and structures.

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NCC 2019 Volume Three

This edition of remains in effect until the adoption of NCC 2022. It contains the requirements for plumbing and drainage for all classes of buildings.

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NCC 2019 Guide

Provides guidance to NCC 2019 Volume One for multi-residential, commercial, industrial and public buildings and structures.

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To access the NCC, register your details here, submit and receive your confirmation email and password

What you will learn

Aims and objectives

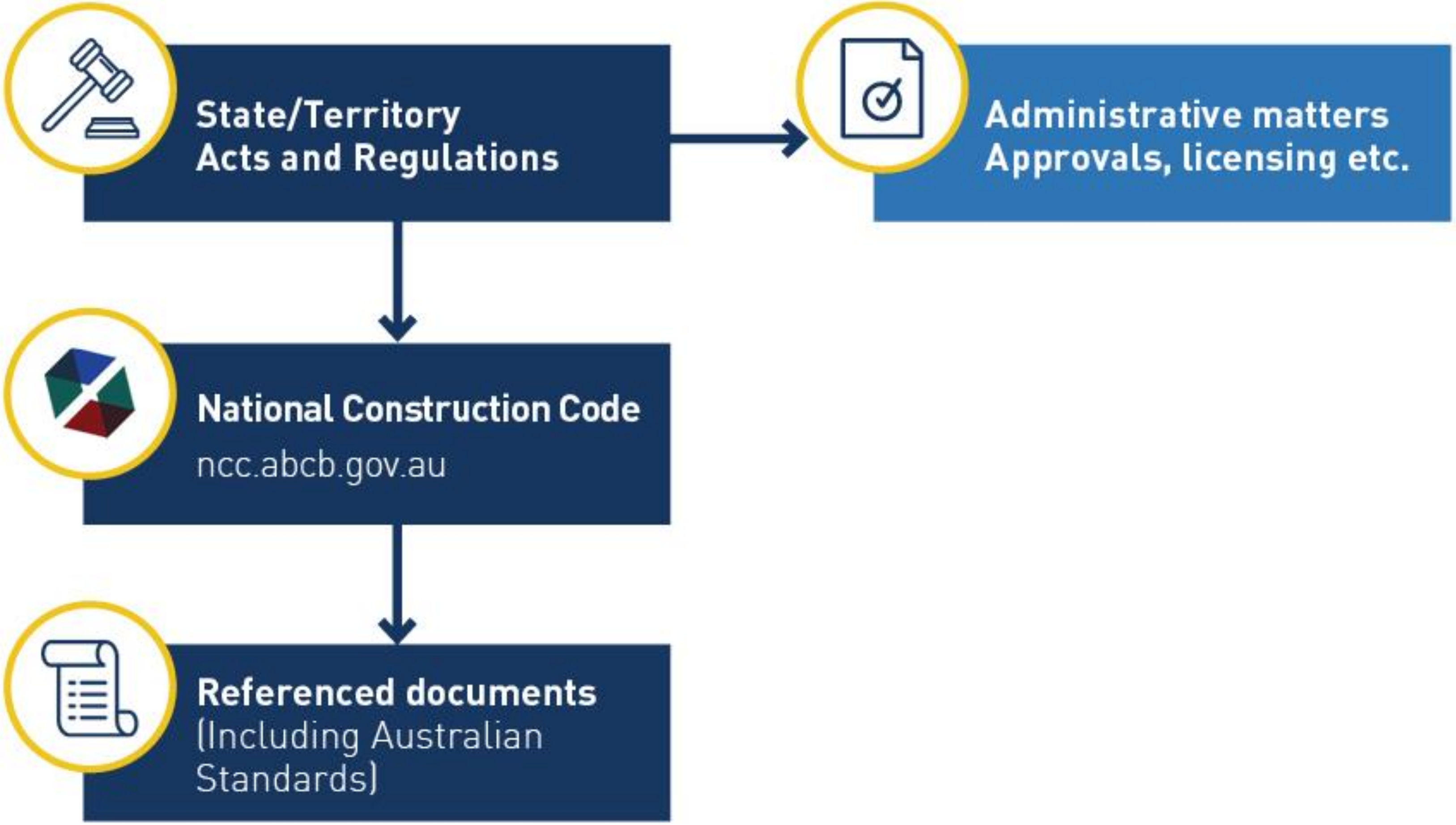
To provide you with a basic understanding of the Performance-based NCC with an emphasis on:

- The structure of the NCC.
- The language used in the NCC Performance Requirements.
- The use of Assessment Methods.

Who this material is for

- All building and plumbing professionals.

Typical Regulatory Structure



State/Territory Acts and Regulations

Administrative matters Approvals, licensing etc.

National Construction Code
ncc.abcb.gov.au

Referenced documents
(Including Australian Standards)

Overview of the NCC

The role of the NCC is to provide:

- nationally consistent minimum necessary standards; and
- a technical base for the design and construction of buildings and certain structures.

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The goal of the NCC is to achieve minimum necessary standards relevant to:

- safety (including structural safety and safety from fire); and
- health, accessibility, amenity and sustainability.

The structure of the NCC

There are currently three Volumes in the NCC.

The Building Code of Australia (BCA) is Volume One and Volume Two of the NCC

- Volume One pertains primarily to Class 2 to 9 buildings.
- Volume Two pertains primarily to Class 1 and 10 buildings.

The Plumbing Code of Australia (PCA) is Volume Three of the NCC (implemented in 2011)

- PCA Volume Three pertains primarily to plumbing and drainage associated with all building classifications.

NCC
Volume One

NCC
Volume Two

NCC
Volume Three

What does the NCC apply to?

The **BCA** applies to:

- new construction;
- additions and alterations; and
- change of use of a building.

The **PCA** applies to:

- new installations;
- alterations, additions, replacements; and
- repairs to existing installations.

Overview of the Governing Requirements

The Governing Requirements provide the rules and instructions for using and complying with the NCC. They include provisions for:

- interpreting and applying the NCC;
- complying with the NCC;
- how the NCC is applied in States and Territories;
- applying referenced documents;
- documenting the suitability of the design, construction and or use of materials to comply with the NCC; and
- classifying buildings by characteristics and intended use.

Complying with the NCC

- The NCC is a performance-based code; this means it provides options and flexibility when developing compliance solutions.

National Construction Code

- These solutions are used to achieve compliance with the Performance Requirements.
- The ABCB has a YouTube clip called “NCC: a Performance-based Code”, explaining the NCC as a performance-based code, which may also be helpful.

Performance-based codes

Prescriptive regulation

WHEN

WHAT

HOW

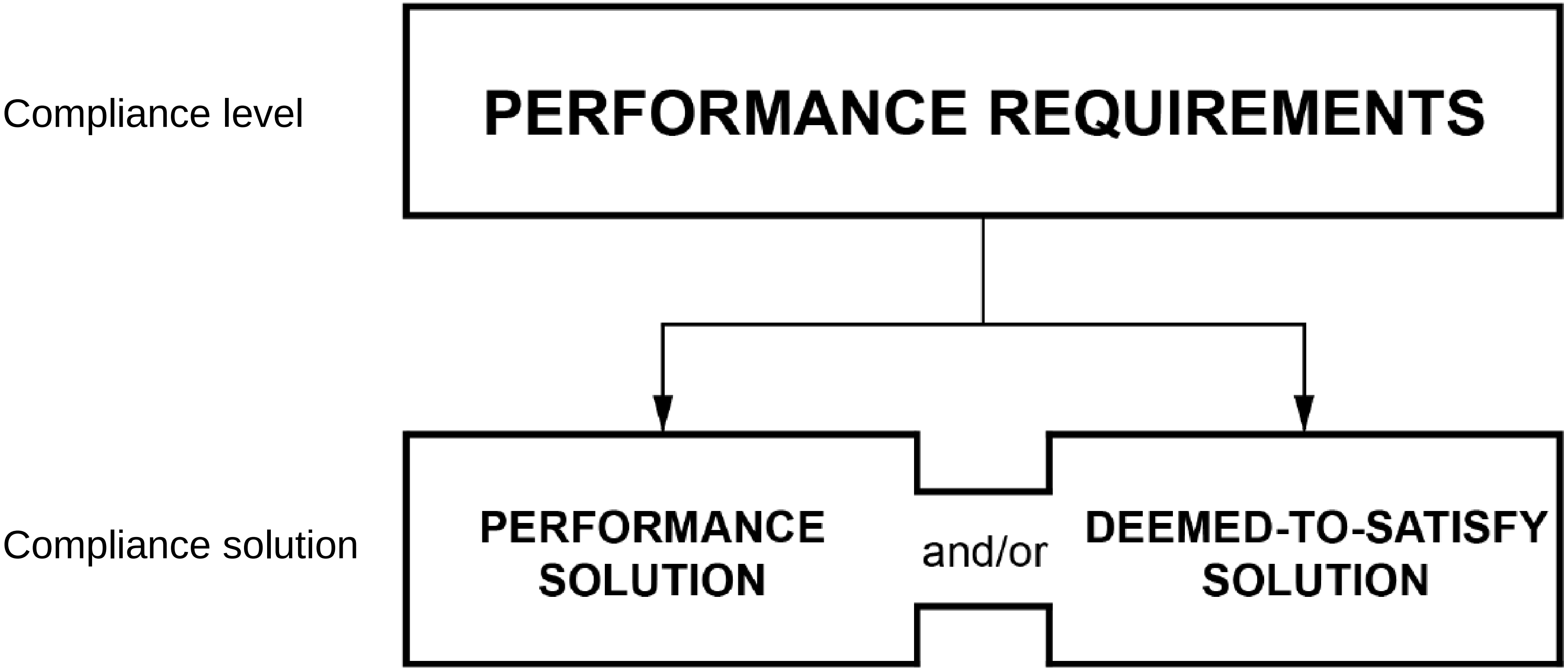
Deemed-to-Satisfy Solutions

Performance regulation

Describes mandatory levels of performance

Performance Solutions

“Compliance with the NCC is achieved by satisfying the Governing Requirements of the NCC and the Performance Requirements”



Compliance level

PERFORMANCE REQUIREMENTS

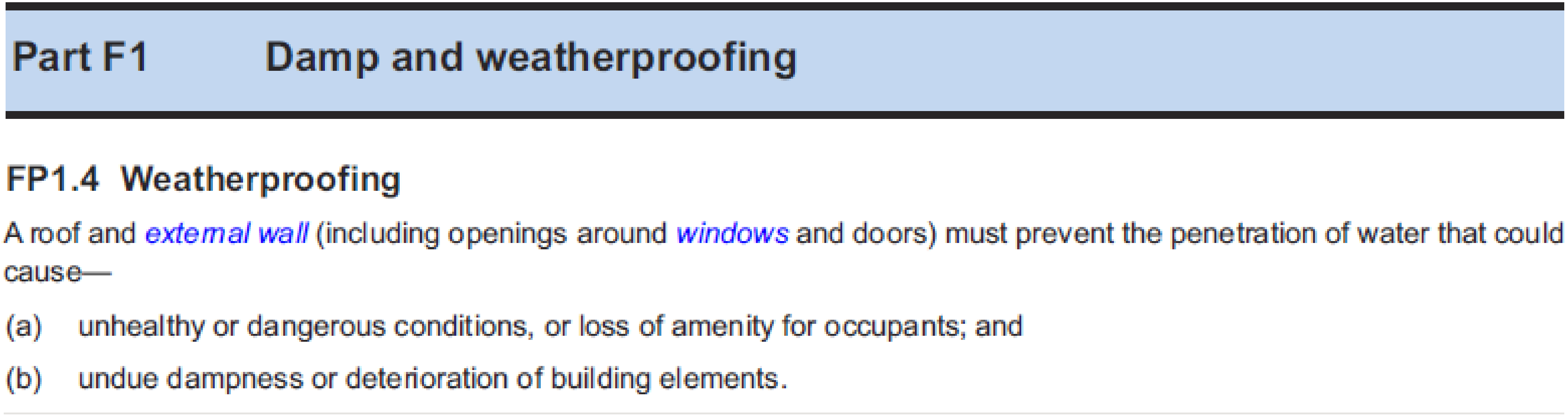
Compliance solution

PERFORMANCE SOLUTION

and/or

DEEMED-TO-SATISFY SOLUTION

Example: Developing a compliance solution



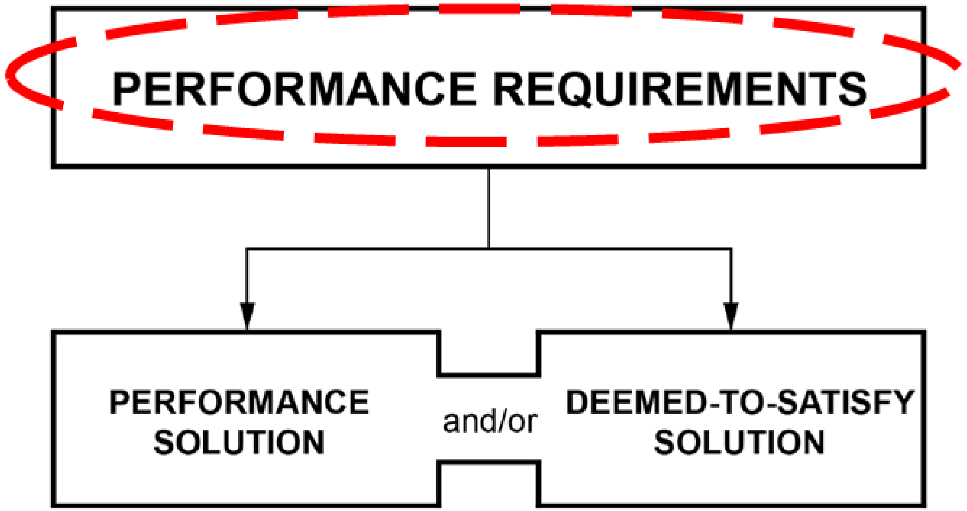
Part F1 Damp and weatherproofing

FP1.4 Weatherproofing

A roof and *external wall* (including openings around *windows* and doors) must prevent the penetration of water that could cause—

(a) unhealthy or dangerous conditions, or loss of amenity for occupants; and

(b) undue dampness or deterioration of building elements.



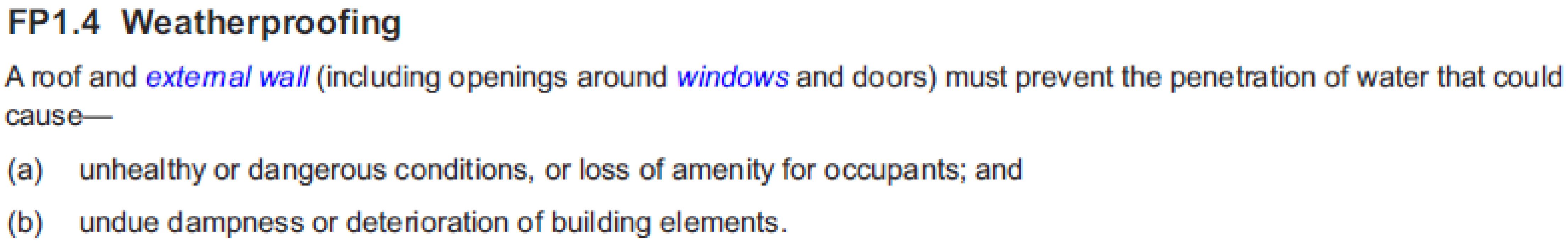
PERFORMANCE REQUIREMENTS

PERFORMANCE SOLUTION

and/or

DEEMED-TO-SATISFY SOLUTION

Option 1 – Performance Solution



FP1.4 Weatherproofing

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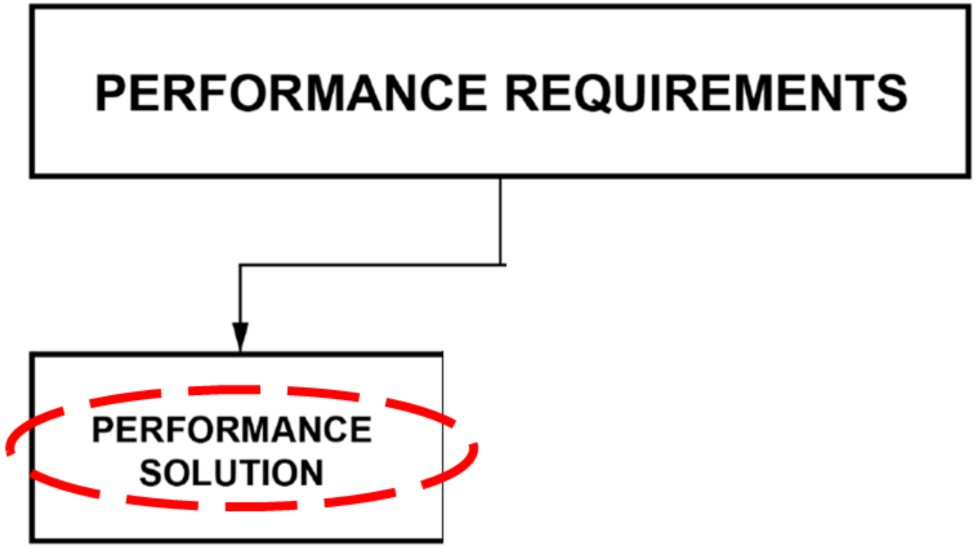
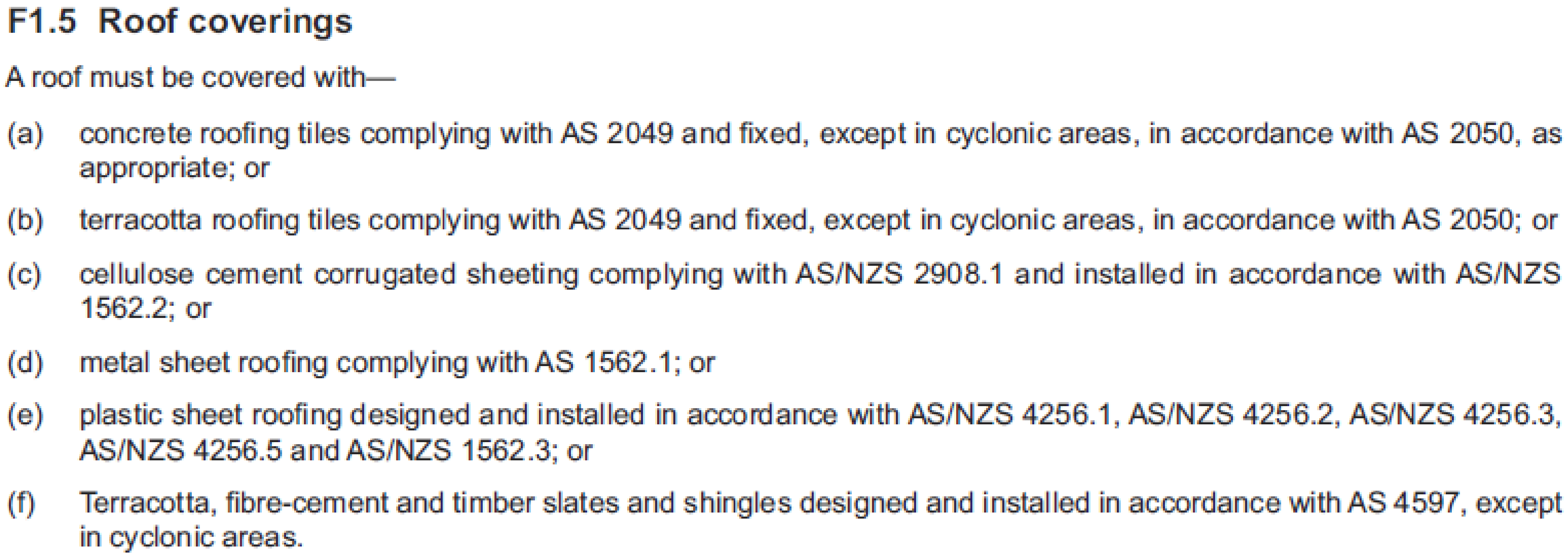


PERFORMANCE REQUIREMENTS

PERFORMANCE SOLUTION

Option 2 – Deemed-to-Satisfy Solution



F1.5 Roof coverings

A roof must be covered with—

(a) concrete roofing tiles complying with AS 2049 and fixed, except in cyclonic areas, in accordance with AS 2050, as appropriate; or

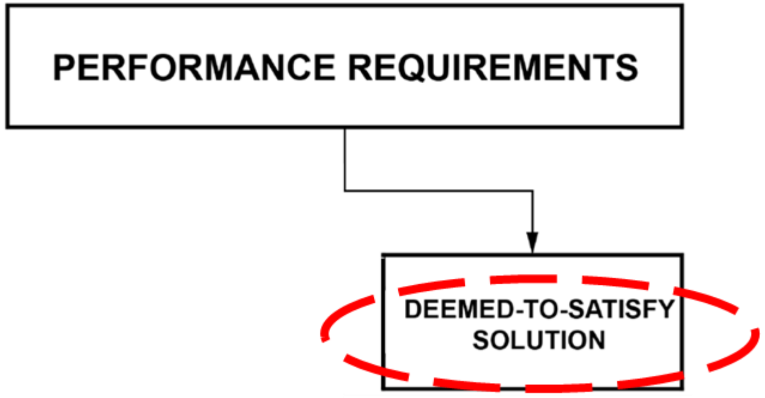
(b) terracotta roofing tiles complying with AS 2049 and fixed, except in cyclonic areas, in accordance with AS 2050; or

(c) cellulose cement corrugated sheeting complying with AS/NZS 2908.1 and installed in accordance with AS/NZS 1562.2; or

(d) metal sheet roofing complying with AS 1562.1; or

(e) plastic sheet roofing designed and installed in accordance with AS/NZS 4256.1, AS/NZS 4256.2, AS/NZS 4256.3, AS/NZS 4256.5 and AS/NZS 1562.3; or

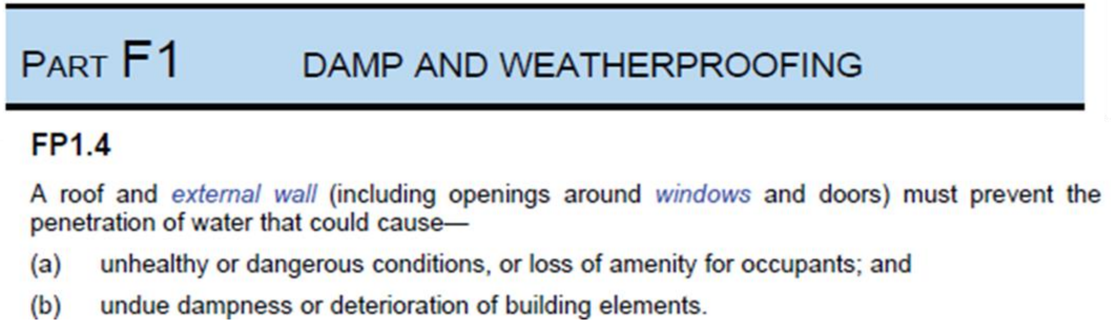
(f) Terracotta, fibre-cement and timber slates and shingles designed and installed in accordance with AS 4597, except in cyclonic areas.



PERFORMANCE REQUIREMENTS

DEEMED-TO-SATISFY SOLUTION

Option 3 – Combination of Performance and Deemed-to-Satisfy Solutions



PART F1 DAMP AND WEATHERPROOFING

FP1.4

A roof and *external wall* (including openings around *windows* and doors) must prevent the penetration of water that could cause—

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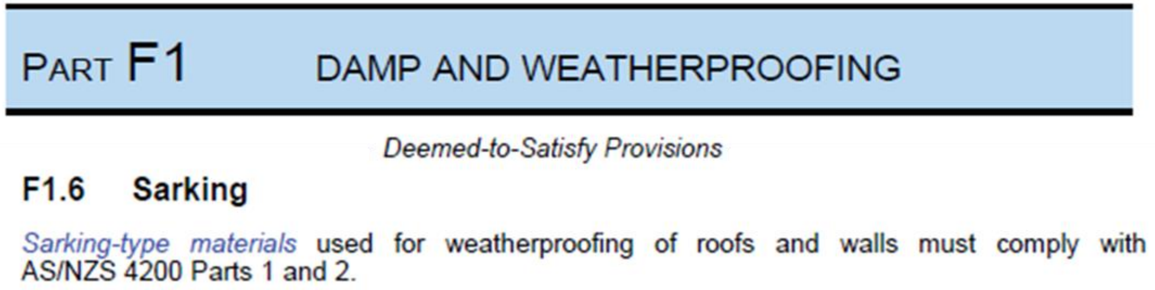
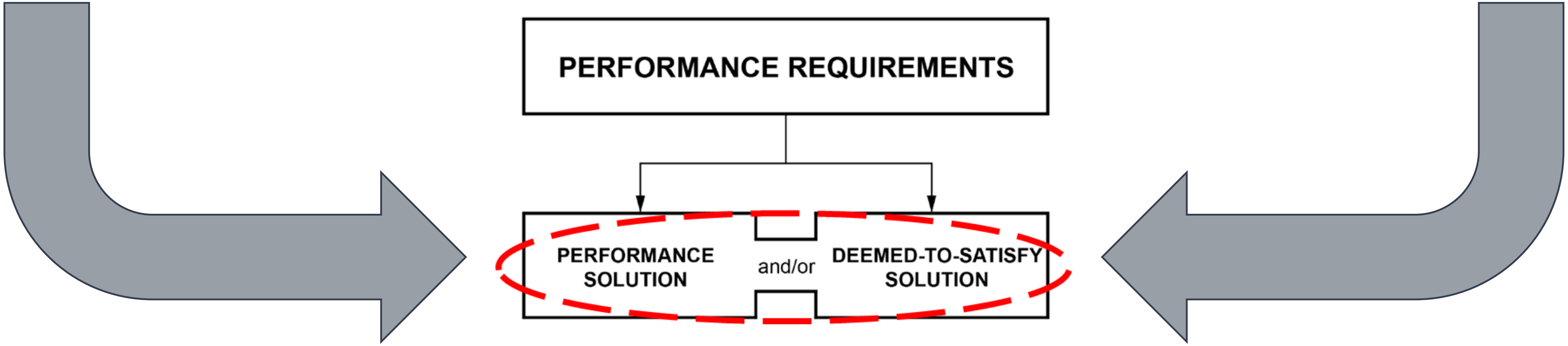


PART F1 DAMP AND WEATHERPROOFING

Deemed-to-Satisfy Provisions

F1.6 Sarking

Sarking-type materials used for weatherproofing of roofs and walls must comply with AS/NZS 4200 Parts 1 and 2.



PERFORMANCE REQUIREMENTS

PERFORMANCE SOLUTION and/or **DEEMED-TO-SATISFY SOLUTION**

An overview of Performance Requirements

- Language used in the Performance Requirements of the NCC.
- What is required when formulating Performance Solutions?

An overview of Performance Requirements

A Performance Requirement is:

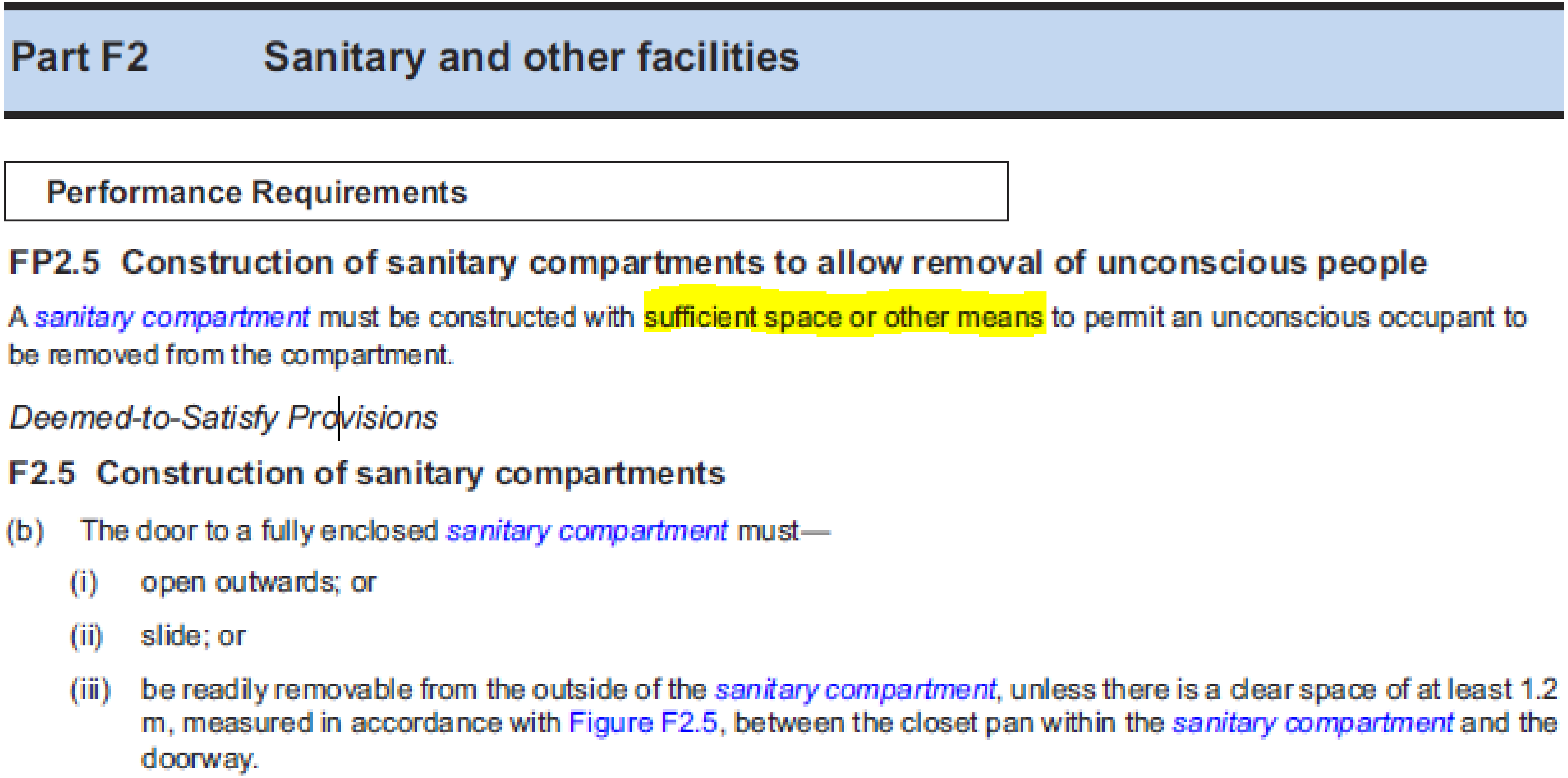
> *“A requirement which states the level of performance which a compliance solution must meet.”*

The NCC contains both qualitative and quantitative Performance Requirements.

Qualitative Performance Requirements

- Qualitative Performance Requirements prescribe attributes or ‘qualities’ to achieve a certain level of performance.
- Performance Requirement FP2.5 is an example.

Qualitative Performance Requirements



Part F2 Sanitary and other facilities

Performance Requirements

FP2.5 Construction of sanitary compartments to allow removal of unconscious people

A *sanitary compartment* must be constructed with sufficient space or other means to permit an unconscious occupant to be removed from the compartment.

Deemed-to-Satisfy Provisions

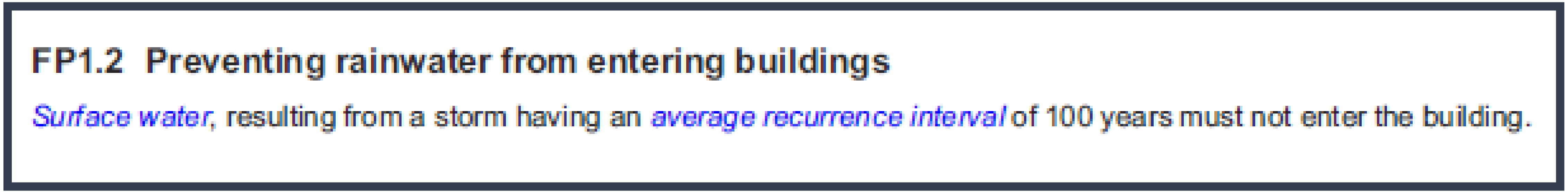
F2.5 Construction of sanitary compartments

(b) The door to a fully enclosed *sanitary compartment* must—

- (i) open outwards; or
- (ii) slide; or
- (iii) be readily removable from the outside of the *sanitary compartment*, unless there is a clear space of at least 1.2 m, measured in accordance with Figure F2.5, between the closet pan within the *sanitary compartment* and the doorway.

Quantitative Performance Requirements

- Quantitative Performance Requirements contain values that provide an absolute measure of performance.
- Quantified Performance Requirements still allow various methods to achieve compliance, however, the specified value is mandatory and Performance Solutions must, at least, comply with that value.
- Performance Requirement FP1.2 is an example.



FP1.2 Preventing rainwater from entering buildings

Surface water, resulting from a storm having an *average recurrence interval* of 100 years must not enter the building.

Language of Performance Requirements

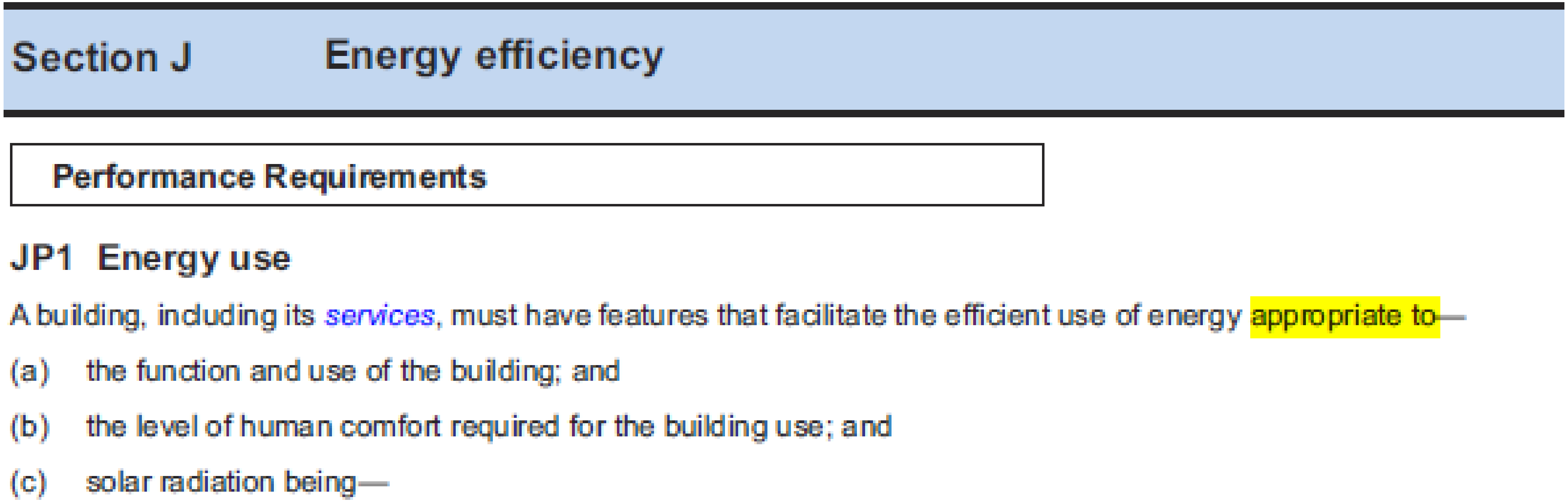
The language used in the Performance Requirements includes the following terms:

- **“To the degree necessary”** – for example:

  “a building must have elements which will, to the degree necessary, avoid the spread of fire…”

- **“Sufficient”** – for example: *“… to allow sufficient time for the orderly evacuation of the building in an emergency.”*
- **“Suitable”** – for example.: *“So that people can move safely to and within a building… any stairways or ramps … must have suitable handrails…”*
- **“Appropriate to”** – for example: *“Suitable sanitary facilities for personal hygiene must be provided in a convenient location within or associated with a building, appropriate to its function or use..”*

An example of the language



Section J Energy efficiency

Performance Requirements

JP1 Energy use

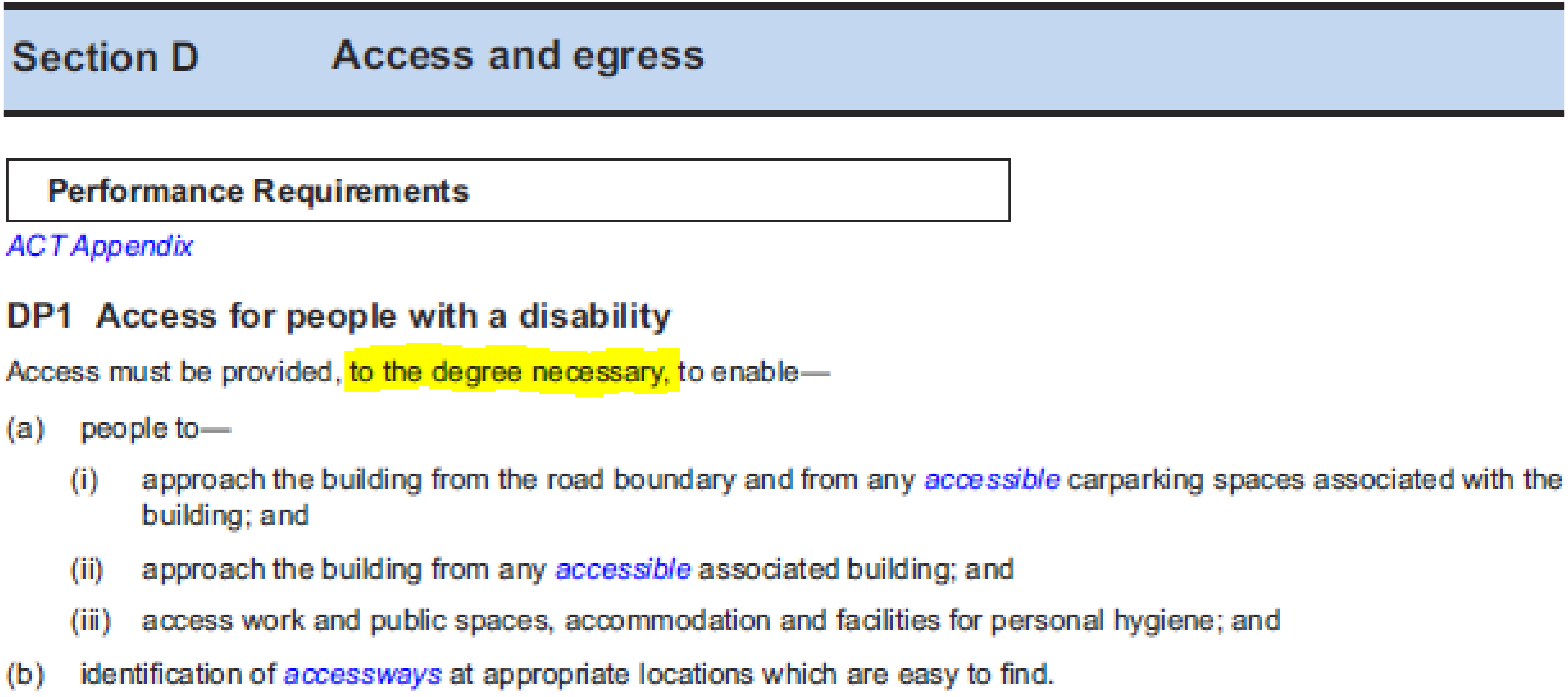
A building, including its *services*, must have features that facilitate the efficient use of energy appropriate to—

(a) the function and use of the building; and

(b) the level of human comfort required for the building use; and

(c) solar radiation being—

An example of the language



Section D Access and egress

Performance Requirements

ACT Appendix

DP1 Access for people with a disability

Access must be provided, to the degree necessary, to enable—

(a) people to—

  (i) approach the building from the road boundary and from any *accessible* carparking spaces associated with the building; and

  (ii) approach the building from any *accessible* associated building; and

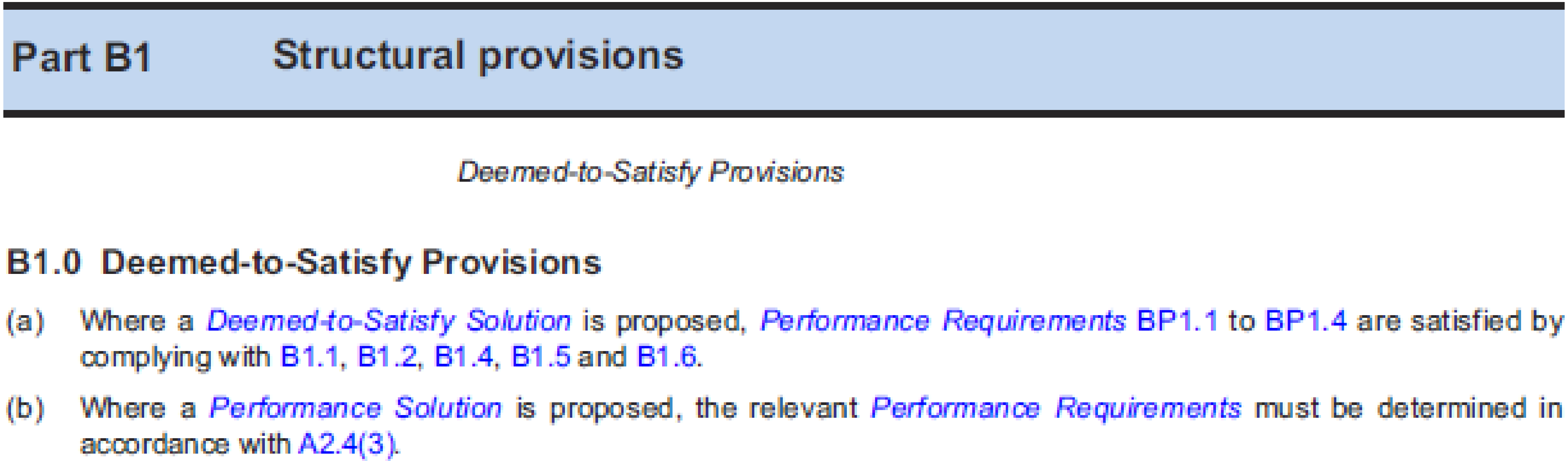
  (iii) access work and public spaces, accommodation and facilities for personal hygiene; and

(b) identification of *accessways* at appropriate locations which are easy to find.

Identifying the relevant Performance Requirements

- When formulating a Performance Solution, ensuring that all relevant Performance Requirements are identified is critical.
- Volume One Part A2 must be used to identify the relevant Performance Requirements.
- It is beneficial for designers to discuss the application of Part A2 with the Approval Authority prior to proceeding with detailed development of a Performance Solution.

Identifying the relevant Performance Requirements



Part B1 Structural provisions

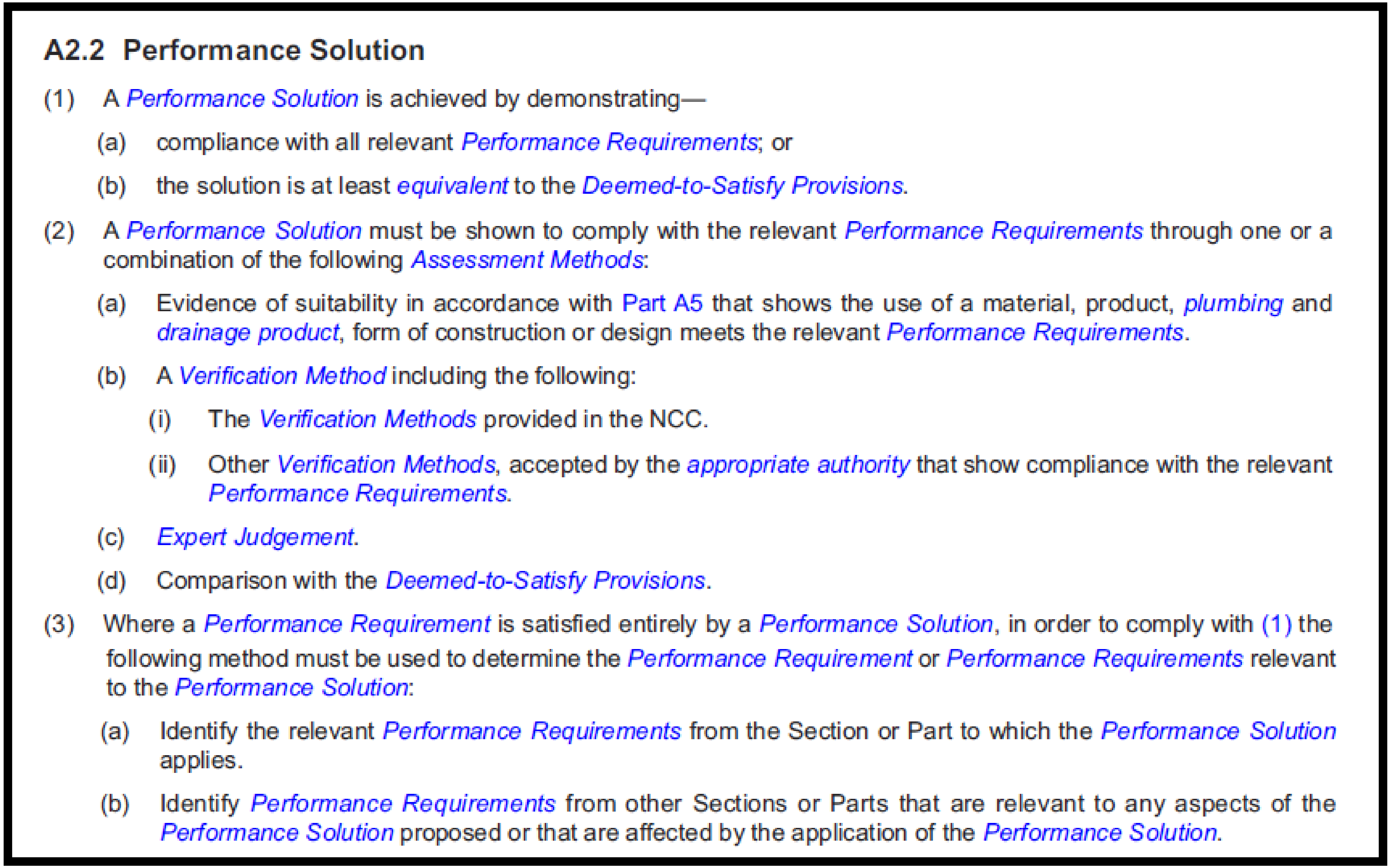
Deemed-to-Satisfy Provisions

B1.0 Deemed-to-Satisfy Provisions

(a) Where a *Deemed-to-Satisfy Solution* is proposed, *Performance Requirements* BP1.1 to BP1.4 are satisfied by complying with B1.1, B1.2, B1.4, B1.5 and B1.6.

(b) Where a *Performance Solution* is proposed, the relevant *Performance Requirements* must be determined in accordance with A2.4(3).

Identifying the relevant Performance Requirements



A2.2 Performance Solution

(1) A *Performance Solution* is achieved by demonstrating—

- (a) compliance with all relevant *Performance Requirements*; or
- (b) the solution is at least *equivalent* to the *Deemed-to-Satisfy Provisions*.

(2) A *Performance Solution* must be shown to comply with the relevant *Performance Requirements* through one or a combination of the following *Assessment Methods*:

- (a) Evidence of suitability in accordance with Part A5 that shows the use of a material, product, *plumbing and drainage product*, form of construction or design meets the relevant *Performance Requirements*.
- (b) A *Verification Method* including the following:
  - (i) The *Verification Methods* provided in the NCC.
  - (ii) Other *Verification Methods*, accepted by the *appropriate authority* that show compliance with the relevant *Performance Requirements*.
- (c) *Expert Judgement*.
- (d) Comparison with the *Deemed-to-Satisfy Provisions*.

(3) Where a *Performance Requirement* is satisfied entirely by a *Performance Solution*, in order to comply with (1) the following method must be used to determine the *Performance Requirement* or *Performance Requirements* relevant to the *Performance Solution*:

- (a) Identify the relevant *Performance Requirements* from the Section or Part to which the *Performance Solution* applies.
- (b) Identify *Performance Requirements* from other Sections or Parts that are relevant to any aspects of the *Performance Solution* proposed or that are affected by the application of the *Performance Solution*.

Identifying the relevant Performance Requirements

The Guide to NCC Volume One can also provide valuable assistance in identifying the relevant Performance Requirements when formulating Performance Solutions.

In particular, the Guide provides clarification of the intent of the Performance Requirements.

Assessing Performance Solutions

- NCC Provision A2.2 states that Performance Solutions will only comply with the NCC when the Assessment Methods used demonstrate compliance with Performance Requirements.

- NCC Provision A2.2(2) describes the four Assessment Methods that can be used to demonstrate compliance.

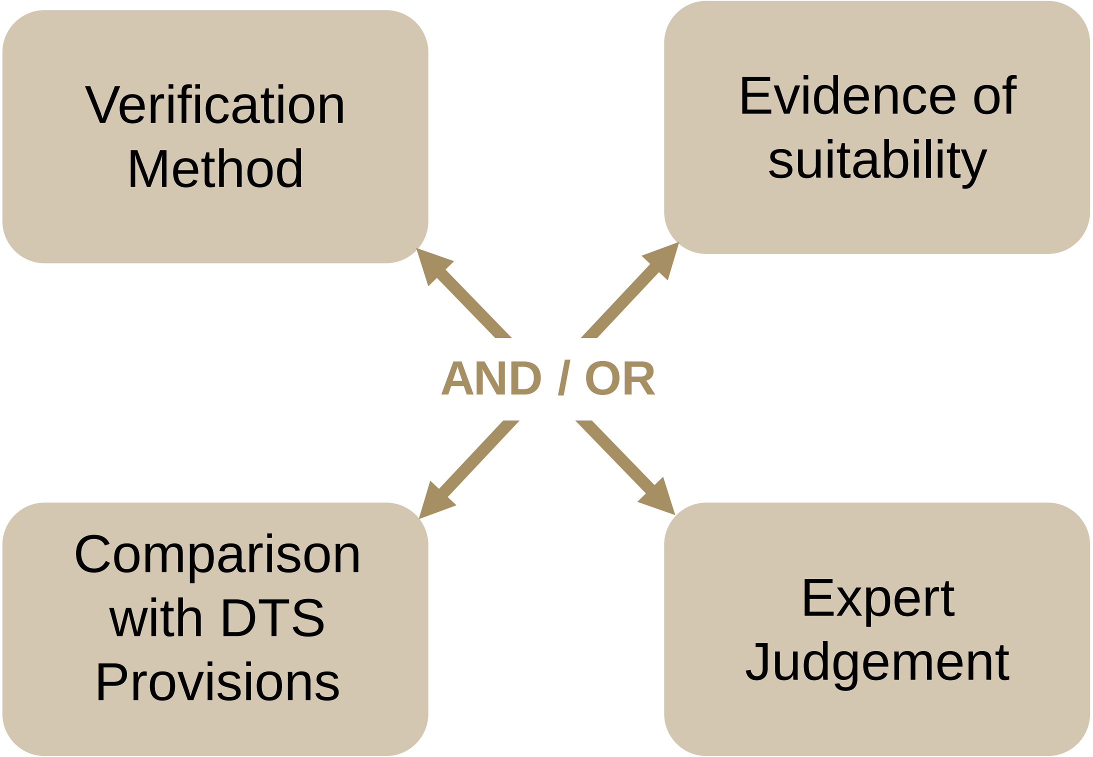
- Designers should discuss which Assessment Method should be used with the Approval Authority prior to proceeding with the detailed development of a Performance Solution.
- A DTS Solution can also demonstrate compliance with the DTS Provisions through the use of Assessment Methods. Refer to A2.3 for further details.

Types of Assessment Methods for Performance Solutions

There are four Assessment Methods in the NCC that can be used to demonstrate the compliance of a Performance Solution with the relevant Performance Requirements. These are:

- Evidence of suitability;
- Verification Methods;
- Expert Judgement; and
- Comparison to Deemed-to-Satisfy Provisions.

The Assessment Methods are listed in Part A2 of the Governing Requirements of each Volume of the NCC.



Verification Method

Evidence of suitability

AND / OR

Comparison with DTS Provisions

Expert Judgement

Assessment Methods: Evidence of suitability

- Evidence of suitability – introduced in Part A2 in all Volumes – documentary evidence.
- Part A5 describes the documentary evidence requirements across all Volumes.
- Recognised expert.
- Professional engineer.
- Certification mark.
- Other documentary evidence.
- Used for both Performance Solutions and DTS Solutions.

Evidence of suitability for Volume Three

- Part A2.2 introduces evidence of suitability requirements for Volume Three. Part A5.3 describes these requirements in more detail.
- A key difference to Volumes One and Two is the mandatory WaterMark Certification Scheme.
- Products subject to the Scheme must have a ‘Watermark Licence’.
- Other materials and products - recognised expert or report from a Registered Testing Authority.
- Report from a professional engineer.
- Other documentary evidence.
- Used for both Performance Solutions and DTS Solutions.

Assessment Methods: Verification Methods

- Verification Method (VM) – a defined term in the NCC.
- It is defined as:
  - a test, inspection, calculation, or other method that determines whether a Performance Solution complies with the relevant Performance Requirements.
- A practitioner can use a VM within the NCC, or a VM which is not in the NCC.
- Used for Performance Solutions.

Assessment Methods: Expert Judgement

- This is a broad definition and should be applied judiciously.
- The expert needs to have a demonstrated knowledge of the technical issues involved, supported by peer recognition.
- Used for Performance Solutions and DTS Solutions.

Assessment Methods:
Comparison with Deemed-to-Satisfy Provisions

- A Performance Solution may be compared to a current Deemed-to-Satisfy Provision to highlight how it will achieve compliance with the Performance Requirements.

- Used for Performance Solutions.

Conclusion

Upon completion, you will have gained a basic understanding of the performance-based NCC with an emphasis on:

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- the structure of the NCC;
- the language used in the Performance Requirements; and
- the use of Assessment Methods.

Assessment Questions

Answers are indicated in red.

Question 1

True or false? If the NCC references a document such as an Australian Standard, this document becomes a regulatory document.

a) True
b) False.

Question 2

Volume Three of the NCC pertains primarily to:

a) The design and construction requirements for Class 2-9 buildings
b) Plumbing and drainage associated with all classifications of buildings
c) The design and construction requirements for Class 1 and 10 buildings.

Assessment Questions

(continued)

Question 3

True or false? Prescriptive regulations prescribe the level of performance that must be achieved but do not prescribe a means of meeting the requirements.

a) True
b) False

Question 4

True or false? Performance Requirements are an optional compliance pathway.

a) True
b) False

Assessment Questions

(continued)

Question 5

True or false? Performance-based regulations set levels of performance that must be achieved.

a) True
b) False.

Question 6

Performance Solutions may be used to:

a) Improve constructability
b) Incorporate new and innovative designs, materials and systems
c) Improve cost effectiveness of the solution
d) All of the above.

Assessment Questions

(continued)

Question 7

True or false? Only Verification Methods within the NCC may be used.

a) True
b) False

Question 8

True or false? It may be suitable for a Drainage Solution to be a combination of both Deemed-to-Satisfy Provisions and Performance Solutions.

a) True
b) False

Assessment Questions

(continued)

Question 9

True or false? The Performance Requirements in the NCC prescribe certain materials that must be used in a design.

a) True
b) False.

Question 10

True or false? Generally the NCC applies to new buildings and new building work in existing buildings.

a) True
b) False.

Assessment Questions

(continued)

Question 11

True or false? Qualitative Performance Requirements prescribe certain attributes or qualities to achieve a certain level of performance.

a) True
b) False.

Question 12

True or false? Quantified Performance Requirements contain values that provide an absolute measure which a Performance Solution must at least comply with.

a) True
b) False.

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